

THE GENERA GYNURA AND CRASSOCEPHALUM IN JAVA

by

C. A. BACKER (Heemstede).

As far as known at present there occur in Java 4 wild species of *Gynura*, viz. *G. aurantiaca* (Bl.) DC., *G. carnosula* Z.M., *G. densiflora* Miq. and *G. procumbens* (Lour.) Merr. A fifth species, *G. pseudochina* (L.) DC., is met with as a cultivated plant only, and even as such it seems to be very rare. A sixth, *G. crepidioides* Bth., an African plant of recent introduction, is better placed in *Crassocephalum*.

Only one of the wild species, *G. procumbens*, occurs throughout the island, from sea-level up to about 2100 m. altitude. *G. aurantiaca* is restricted to West- and Central-Java, where it is found between 750 and 2400 m. alt.; along watercourses, however, it occasionally descends¹ as low as 350 m.; its area of distribution, extending from Mount Gèdè to Mount Wilis, slightly overlaps in its eastern part the western extremity of that of *G. densiflora*. — *G. densiflora*, though reported to have been found almost a century ago in West-Java, seems, at present at least, to be confined to the eastern half of the island. It is a true mountain plant, growing between 2000 and 2600 m. above sea-level; its area of distribution extends from Mount Lawu to Mount Idjèn. *G. densifolia* appears to be essentially a sea-shore species; it has been found only in the eastern half of Java along the southern coast.

Crassocephalum crepidioides, a weed introduced a few years ago, has since spread rapidly, and is likely to become within a few years a common plant. Its present area of distribution, which is still extending, cannot accurately be given.

Further data about distribution may be found below at the end of the description of each single species.

As most of the descriptions of the Javan *Gynuras*, published up to now, suffer from incompleteness and hence are insufficient for recognizing the plants with certainty, I have thought it advisable

¹ In Java it is extremely common that along watercourses mountain-plants descend far beneath the lower limit of their proper area.

to give here a detailed description of each of the six above-mentioned species, preceded by a description of the genera *Gynura* and *Crassocephalum* and by a key to the Javan species of *Gynura*. I have used for this study materials preserved in the herbaria of Buitenzorg, Leyden and Utrecht. The height of the plants and the altitude of the localities are given in meters; the months in which they are flowering are indicated by Roman numerals. W. stands for West-Java (from Sunda Straits to the meridian of Cheribon, Long. $108^{\circ}34'$ E); C. stands for Central-Java (from the meridian of Cheribon to that of Kediri, Long. $112^{\circ}1'$ E); E. stands for East-Java (from the meridian of Kediri to Bali Straits).

Gynura Cass.

Heads medium-sized, corymbose; corymbs terminal and frequently also in the higher leaf-axils, often forming together a leafy panicle; flowers all tubular, regular, ♀. Inner involucre bracts 1- to 2-seriate, narrow, of equal length, herbaceous or more or less fleshy, with overlapping thin translucent margins, during anthesis erect and cohering into a cylindrical tube, afterwards spreading or reflexed; outer bracts 3- ∞ , much shorter and narrower than the inner ones, unequal, free. Receptacle flat or nearly so, epaleaceous, alveolate; alveoles cupular, with entire or dentate-lobate margin, each containing one flower. Corolla at first yellow or orange, the older ones often turning reddish brown to dark purple; tube thin, at the very base abruptly and rather conspicuously widened; limb tubular or narrowly campanulate, rather abruptly set off from the tube and much shorter than the latter, 5-fid; segments oblong, the tips on the back sometimes shortly papillose, otherwise glabrous. Stamens synantherous; anther-bases entire or nearly so; tip of connective produced into a narrow scale. Style-arms long, thin, gradually passing into rather long, linear-subulate, hairy tips, tips inclusive $2\frac{1}{2}$ mm. or more long. Achenes narrowly linear or linear-fusiform; at the base with a pale ring; at the apex dilated into a rather broad disk or shallow cup; with 9-10 close-set finely tuberculate longitudinal ribs, between the ribs hairy or glabrous; pappus-hairs numerous, caducous, long, thin and finely denticulate, pure white. Leaves alternate, entire or more or less deeply dentate-serrate or pinnatisect. Erect, climbing, creeping or prostrate, usually hairy, often robust herbs.

Differs from *Crassocephalum* by the quite different tips of the style-arms, by the abruptly and conspicuously widened base of the corolla-tube, and by the limb of the corolla rather abruptly set off from the tube.

Key to the Javan species.

1. Exclusively cultivated; erect. Roots much swollen. Leaves rather crowded on a short stem, in outline obovate-oblong, deeply and regularly lyrate-pinnatifid, with 2-6 segments on either side, thinly hairy or subglabrous; incisions between the segments not reaching the midrib. Heads few, in erect long-peduncled corymbs; peduncles of heads $\frac{1}{4}$ - $2\frac{1}{2}$ cm., densely appressed pubescent; inner involucre bracts 11-14, 9-12 mm. long; some of them covered on the back with rather long white hairs. Corolla

yellow; tips of corolla-segments papillose at the back. Ovary glabrous; fruit in Java not developing. Height of entire plant 75 cm. or less.

5. *G. pseudochina* p. 457

Usually wild; if cultivated, then in the adult state always climbing or creeping. Roots not swollen. Leaves not as described above . . . 2

2. Achenes glabrous; pappus 8—16 mm. long. Tips of corolla-segments on the back not or but indistinctly papillose 3
Achenes between the ribs clothed with numerous short, thick, appressed or obliquely erect hairs; pappus $4\frac{1}{2}$ —7 mm. long. Tips of corolla-segments on the back coarsely papillose. Sea-side plant, growing by preference on or quite near the cliffs.

2. *G. carnosula* p. 453

3. Rigidly erect plant (also when adult), found above 1500 m. alt. Young parts densely clothed with long *white* hairs. Heads usually numerous, in dense corymbs. Inner involucre bracts 13—18, rigid, at the extreme tips with very short thickish hairs, otherwise glabrous. Achenes $3\frac{1}{2}$ — $3\frac{3}{4}$ mm. long. Petioles of lower leaves $\frac{3}{4}$ — $2\frac{1}{2}$ cm., not auriculate at the base. Leaves not deeply incised 3. *G. densiflora* p. 454
Adult plants climbing, prostrate or creeping. Young parts glabrous or hairy; hairs either rather short and white, or long and purple. Inner involucre bracts 8—13, either glabrous or entirely covered with hairs. Achenes 4—6 mm. long 4

4. All young parts densely clothed with rather long, articulate, *purple* hairs. Base of petiole usually auriculate. Larger leaves at the base or in their lower halves often pinnatisect, 6—12 cm. wide. Inner involucre bracts 9—11 mm. long. Corolla 12—14 mm. long. Achenes 4— $4\frac{1}{2}$ mm. long 1. *G. aurantiaca* p. 451
Young parts glabrous or with rather short, white hairs. Base of petiole usually not auriculate. Larger leaves not pinnatisect, $1\frac{1}{4}$ —6 cm. wide. Involucre bracts 11—18 mm. long. Corolla 12—20 mm. long. Achenes $4\frac{1}{2}$ —6 mm. long

4. *G. procumbens* p. 455

1. *Gynura aurantiaca* (Bl.) DC. Prodr. VI (1837), 300, — Miquel, Flora Ind. Bat. II, 98, — Hallier in Meded. Rijksherb. Leiden 12 (1912), 18, quoad Elbert Ns 42 (non Ns 43 qui est *G. densiflora* Miq.), — Koorders, Exkursionsfl. III, 343 (excl. syn. omnib. praeter *Cacalia aurantiaca* Bl. et *G. Teysmanniana* Kds.), — Flora von Tjibodas III, 2, 80 (syn. ut supra), — Hochreutner in Candollea V, 329

(1934), — *Gynura densifolia* Miq. var. *atropurpurea* (O.K.) Kds., Exkursionsfl. III, 344 (1912), — *Gynura dichotoma* Turcz. in Bull. Soc. Imp. Natural. Moscou XXIV, 1, 202 (1851) ex descr.; (L o b b, Ns 241), — *Cacalia aurantiaca* Bl. Bijdragen (1826), 908, — *Crassocephalum aurantiacum* O.K., *Cr. densifolium* O.K. var. *atropurpureum* O.K. et *Cr. Teysmannianum* O.K. Rev. Gen. Plant. I (1891), 331.

Heads more or less numerous in a 20—60 cm. long, divaricately branched panicle or corymb. Axes of inflorescence, peduncles of the heads, and back of the herbaceous part of the involucre bracts, when young, densely clothed with patent or erecto-patent, articulate, purple hairs. Axes of inflorescence and frequently also the upper part of the peduncles of the heads bearing patent, linear, very narrow bracts; peduncles $1\frac{1}{2}$ —6 cm. Flowers offensively smelling. Inner involucre bracts 11—13, linear or linear-lanceolate, all acute, or the wider ones obtuse, 9—11 mm. long, $1\frac{1}{2}$ —3 mm. wide; herbaceous part thick, rigid; translucent margin broad; outer bracts numerous, narrowly linear, 4—6 mm. long. Alveoles of receptacle with lobed walls. Corolla at first orange-yellow, the older ones turning dark purple, 12—14 mm. long; tips of corolla-segments on the back not or but slight papillose. Achenes narrowly linear-fusiform, in their upper halves gradually narrowed upwards, glabrous, brown, 4—4½ mm. long; pappus $8\frac{1}{2}$ —12 mm. — Innovations densely clothed with long purple hairs. Petioles of lower leaves 5—10 cm., densely hairy, at or just above the base often with 2 leafy amplexicaul auricles; base or lower half of leaves frequently divided into a few remote, widely patent, small segments or leaflets; higher leaves gradually shorter petiolate, topmost sessile or subsessile; sometimes amplexicaul; lower leaves ovate, elliptic, or oblong; base rounded, cuneate, or contracted into the petiole and decurrent along it; apex acute; margins coarsely and irregularly dentate; leaves at first on both surfaces clothed with long, articulate, purple hairs; hairs of the upper surface breaking off above the base, and the leaves therefore (in dried materials) roughened by numerous, small but quite conspicuous tubercles; hairs of lower surface more persistent; larger leaves 10—20 cm. long, 6—12 cm. wide; topmost ones shorter and much narrower. Perennial; very young plants erect; older ones leaning against other plants or climbing, often with drooping tips. 1.00—3.00 m.; fl. I—XII; from Mount Gədə (W.) eastward to Mount Wilis (C.); 750—2400 m. alt., along watercourses sometimes descending as low as 350 m. alt.; grassy wilds, jungles, open forests and forest-borders; scattered, though locally sometimes frequent. Fine and very conspicuous species!

Grassocephalum Teysmannianum O.K. (vide supra in syn.), which was collected by Teyssmann in Java (more precise locality not given) and sent in 1868 by him to Hasskarl (then residing in Cleve) from whom it came to Kew, was examined at my request by Dr. H. N. Ridley. From the notes Dr. Ridley kindly sent me it appears that the somewhat poor specimen is the apical part of a stem or branch of a rather common form of *Gynura aurantiaca*, with the upper leaves sessile or subsessile, narrowed to the base, amplexicaul and dentate. The involucre bracts are hairy all over the back. It was named by Hasskarl *G. aurantiaca*. Cf. Miquel, Flora Ind. Bat. II, 98, *Gynura aurantiaca* var. β *ovata*. Similar forms were collected by me in Aug. 1914 on Mount Gèdè (No. 15200) and in Sept. 1920 by R. C. Bakhuizen van den Brink on Mount Parang (No. 4963).

2. ***Gynura carnosula* Z.M.!** (sphalmate *carnulosa*) in Zollinger, Syst. Verzeichniss 1854, 124, based on 2378 Z.M., — Miquel, Flora Ind. Batav. II, 100, — *G. densifolia* Miquel, Flora Ind. Batav. II (1856), 99, — Koorders, Exkursionsflora III, 344 [excl. var. *atropurpurea* (O.K.) Kds.].

Heads in often widely branched corymbs, usually 2—16 together at the ends of the long branches of the corymb, occasionally solitary. Axes of inflorescence and peduncles of the heads densely clothed with appressed or obliquely erect, short and fine, white hairs. Peduncles $\frac{1}{2}$ —3 cm. Inner involucre bracts 8—12, oblong or lanceolate, with rather broad translucent margins, acute or the wider ones obtuse, 7—11 mm. long, $1\frac{1}{2}$ —3 mm. wide; the median part thinly to rather densely clothed with appressed short hairs; outer bracts few, 2—4 mm. long. Alveoles of receptacle with either entire or but faintly lobed walls. Corolla orange-yellow, 9—12 mm. long; tips of corolla-segments on the back coarsely papillose. Achenes brown, narrowly linear-fusiform, 4—5 mm. long, between the ribs with numerous short and thick, appressed or obliquely erect, white hairs; pappus $4\frac{1}{2}$ —7 mm. — Stem robust, often more or less woody in the lower part, frequently widely branched from the very base; young stems and young petioles densely clothed with appressed fine white hairs. Petioles $\frac{3}{4}$ — $3\frac{1}{2}$ cm., never auriculate at the base, but sometimes above the base with a solitary auricle; leaves ovate, elliptic, oblong, or obovate; base rounded, obtuse, or cuneate, often unequal; apex rounded, obtuse, or acute, not or hardly acuminate; margins entire or faintly sinuate; both surfaces densely clothed with a fine appressed pubescence; leaves thinly fleshy, 4—11 cm. long, 2—6 cm. wide; topmost leaves small.; fl. X—IV, perhaps I—XII; eastern half of Java, along and near the south-coast, usually on and quite near the cliffs, locally sometimes frequent.

Of this rather rare species I saw the following representatives in the Buitenzorg Herbarium:

1. Zollinger 2378 Z.M.; X. 1844; Srigontjo (S. of Malang) on cliffs near the seashore. Type of *G. carnosula* Z.M.
2. native collector Irsan; Ns 2; 19. II. 1921; Srigontjo, on cliffs near the seashore.
3. D. F. van Slooten, Ns 2459; 12. IV. 1931; Schildpaddenbaai (Turtle-bay) near Popoh in S.-Kediri; on rocks overgrown by plants near the beach; alt. 5 m., a few individuals.
4. A. Rant, Ns 945; 18. VI. 1932; S.-Besuki not far from Glenmore (definite locality unknown).
5. H. Altmann, Ns 420; 21. IV. 1935; Puger (S.-Besuki); on rocks, alt. 10 m, numerous.
6. H. Altmann, Ns 453; 17. XI. 1935; Batu Ulo (S.-Besuki); beach at the foot of the rocks, alt. 1 m, numerous.

and in the Utrecht Herbarium:

7. Horsfield, Patjitan (S.-Madiun). Type of *G. densifolia* Miq.
3. ***Gynura densiflora* Miq.**!, Flora Ind. Bat. II (1856), 99, — *G. aurantiaca* Hallier non DC. in Meded. Rijksherb. Leiden 12 (1912), 18 quoad Elbert Ns 43, haud 42, — *G. aurantiaca* Kds. non DC. in Natuurk. Tijdschr. Ned. Ind. LX (1901), 252, — ?*G. mollis* Sch. Bip. in Zollinger, Syst. Verz. 1854, 124, 127, — Miq., Flora Ind. Bat. II, 100, — *G. ajakensis* Hochr. in Candollea V, 330 (1934).

Heads usually numerous in dense corymbs with linear bracts. Axes of inflorescence and peduncles densely clothed with rather long, articulate, in the living plant white hairs. Peduncles of the heads $\frac{1}{2}$ — $1\frac{3}{4}$ cm., often with a few linear bracts. Inner involucre bracts 13—18, linear or linear-lanceolate, acute or the wider ones obtuse, 10—13 mm. long, $1\frac{1}{2}$ —3 mm. wide; median part fleshy, very rigid, at the extreme tip clothed with very short, thick hairs, otherwise quite glabrous; outer involucre bracts numerous, 4—6 mm. long. Alveoles of receptacle with toothed or lobed walls. Corolla orange-yellow, 9— $12\frac{1}{2}$ mm. long; tips of corolla-segments on the back not papillose. Achenes narrowly linear-fusiform, glabrous, brown, $3\frac{1}{2}$ — $3\frac{3}{4}$ mm. long; pappus 9—12 mm. — Innovations densely clothed with patent, articulate, rather long, soft, white hairs. Petioles of lower leaves 1— $2\frac{1}{2}$ cm., not auriculate at the base, hairy; leaves ovate-oblong or elliptic-oblong, not deeply incised; base cuneate or acute, apex acute, margins dentate-serrate; highest leaves very shortly petioled or sessile with a rounded, or broadly cuneate base; young leaves on both surfaces densely clothed with patent, articulate hairs; hairs of upper surface deciduous above the base, and the leaves therefore (in dried specimens) roughened by small but quite conspicuous tubercles; hairs of lower surface more

persistent; lower leaves 10—17 cm. long, $4\frac{1}{2}$ —7 cm. wide; higher much smaller. Robust, erect. 1.00—2.00 m.; fl. I—XII; from Mount Lawu (C.) eastward to Mount Idjen (E.); 2000—2600 m. alt.; grassy wilds, jungles, open Casuarina-forest, in several parts a rather common plant. Fine, very conspicuous species!

1. In the Utrecht Herbarium I saw a specimen without number, collected by Zollinger in Java (precise locality not given). It had been named by Miquel himself *G. densiflora*, and entirely answers our description. Most probably it is Z.M. 2592, on which *G. densiflora* Miq. was based, and which is the only number cited for this species by Miquel (Flora Ind. Batav. II, 99). Zollinger's plant was collected in the province of Bandung (W.-Java). It seems that the species afterwards has never again been found in the western half of the island. It is somewhat difficult to believe that the given locality is correct, and that, in this frequently explored region, such a very conspicuous plant should have been overlooked by all subsequent collectors. Future investigators in West-Java are requested to look for it, as there are several instances of typical East-Java plants occurring locally in West-Java¹.

2. *Gynura mollis* Sch. Bip. was likewise based on Zollinger 2592. Part of this number (see Zollinger, Syst. Verz. 1854, 124) was collected in W.-Java at the foot of Mount Tangkuban Prahū (near Bandung), locality perhaps identical with the one given by Miquel; part on Mount Ardjuno (East-Java). The original diagnosis of *G. mollis* runs as follows: "Folia ovata dentata acuminata breve petiolata". Unsatisfactory as this description certainly is, it is not incompatible with the characters of *G. densiflora*. If the two species should prove to be identical, the name *mollis* has right of priority. Preferring certainty to uncertainty I adhere for the present to the name *densiflora*.

3. The differences given by Hochreutiner between his *G. ajakensis* and *G. densiflora* do not exist. By some oversight Hochreutiner has taken the characters ascribed by him to *G. densiflora* (folia $3\frac{1}{2}$ —1 poll. longa, suprema floralia . . . multo minora, integerrima, corymbi terminalis compositi rami longiusculi . . . involucri bracteolis 3—6 brevi-lanceolatis subdemissius calyculati) not from Miquel's description of the latter species, but from that of the very different *G. densifolia* Miq. (see sub No. 2, *G. carnosula*), which in Miquel's flora is placed immediately after *G. densiflora*. As a matter of fact Hochreutiner's description of *G. ajakensis* tallies quite well with *G. densiflora*, except as regards the number of inner involucral bracts, which Hochreutiner gives as ca. 12; I never found less than 13, usually more, but they often adhere to each other and then their number of course seems smaller.

4. *Gynura procumbens* (Lour.) Merr., Enum. Philipp. Plants III (1923), 618, — Backer, Onkruidflora der Javasche Suikerrietgronden 808 (excl. syn. *Gynura densiflora* Miq.), — Hochreutiner, in Candollea V, 329 (1934), — *Gynura sarmentosa* (Bl.) DC. Prodromus VI (1837), 298, — Hass-

¹ See Van Steenis, Eenige belangrijke plantengeographische vondsten op den Papandayan (Some important phytogeographical discoveries on Mount Papandayan) in De Tropische Natuur XIX (1930), pp. 73 seq., XXI (1932), pp. 101 seq.

karl, Plant. Jav. rarior. 535, No. 397, — Miquel, Flora Ind. Batav. II, 97, — K o o r d e r s, Exkursionsflora III, 344, — Flora von Tjibodas III, 2, 81, — ?*Gynura Lobbiana* Turcz. in Bull. Soc. Imp. Natural. Moscou XXIV, 1 (1851) 202, — *Gynura pubigera* B old. Zakflora 738, — *Cacalia procumbens* L o u r. Flora Cochinch. (1790) 485, — *Cacalia sarmentosa* B l. Bijdragen (1826) 907, — *Crassocephalum pubigerum* O.K. Rev. Gen. Plant. I (1891) 332 (non *Conyza pubigera* L.).

Heads more or less numerous in corymbs; corymbs terminal and in the higher leaf-axils, often united into a lax panicle bearing small leaves; axes of inflorescence and peduncles of heads glabrous or sparingly to moderately densely clothed with patent short hairs. Peduncles of heads 1—10 cm., often with a few narrow bracts. Flowers with a disagreeable smell. Inner involucre bracts 8—13 linear, acute or the wider ones obtuse, rather thin and flaccid, glabrous or the back of the herbaceous part thinly hairy, sometimes, with the exception of the tips, green or, more often, with a strong reddish-brown flush, and always with reddish-brown tips, 11—18 mm. long, $1\frac{1}{4}$ —3 mm. wide; outer bracts 3—6, narrowly linear, 3—8 mm. long. Alveoles of receptacle with shortly dentate walls. Corolla at first orange-yellow or orange, with age turning purplish-brown, 12—20 mm. long; tips of corolla-segments on the back not papillose. Achenes linear, glabrous, brown, $4\frac{1}{2}$ —6 mm. long; pappus 9—16 mm. — Stem angular, somewhat fleshy, often with a red flush or with red markings, glabrous, or the younger parts with patent, short, white hairs. Petioles of lower leaves 1— $3\frac{1}{2}$ cm., sometimes with 1—2 minute auricles at or slightly above the dilated base; leaves ovate, oblong, or lanceolate; base truncate, rounded, obtuse or acute, less often sagittate or cordate; apex tapering or acuminate, varying from subobtuse to very acute; margins entire, or shallowly to deeply sinuate to dentate; leaves somewhat fleshy, glabrous or, when young, more or less densely clothed with short white hairs 3— $12\frac{1}{2}$ cm. long, $1\frac{1}{4}$ —6 cm. wide; highest leaves small, sessile or subsessile. Perennial; climbing, often with pendulous tops; when no support is available, creeping or prostrate; aromatic; 1.00—6.00 m.; fl. I—XII; throughout Java; 1—2100 m. alt.; especially above 500 m. alt.; sunny or moderately shadowy, humid, or at least not very dry localities, brushwood, hedges, forest-borders, not too dense forest, rarely on grassy plains, usually scattered; sometimes cultivated as a medicinal plant.

The insufficiently and, possibly, as regards the number of inner involucre bracts (given as 6—7), incorrectly described *Gynura Lobbiana* Turcz. [Bull.

Soc. Imp. Naturalistes Moscou XXIV, i (1851) 202; L o b b, Ns. 239] seems to be a form of this species. I have seen no material.

5. *Gynura pseudochina* (L.) DC. Prodrum VI (1837), 299, — M i q u e l, Flora Ind. Bat. II, 100, — K o o r d e r s, Exkursionsflora III, 344, — *Senecio pseudochina* L. Species Plant. I (1753), 867, — B u r m a n, Flora Indica 180, —? *Gynura lyrata* Sch. Bip. in Z o l l i n g e r, Syst. Verzeichn. 1854, 124, 127, — *Crassocephalum pseudochina* O.K. Rev. Gen. Plant. I (1891), 331.

Heads few, in erect, long-peduncled corymbs; peduncle of corymb at the apex densely or rather densely clothed with appressed white hairs, further downward less hairy to subglabrous or glabrous. Peduncles of heads $\frac{1}{4}$ — $2\frac{1}{2}$ cm., densely appressed pubescent, often bearing a few small, narrowly linear bracts. Inner involucre bracts 11—14, linear or linear-lanceolate, acute, or the wider ones obtuse; the back of the herbaceous part thinly to rather densely clothed with rather long thick hairs or some of them glabrous or subglabrous, 9—12 mm. long, $1\frac{1}{2}$ —3 mm. wide; outer bracts subulate, 2—4 mm. long. Alveoles of receptacle with entire or faintly lobed walls. Corolla yellow, not turning reddish, 11—12 mm. long; tips of corolla-segments on the back papillose. Ovary glabrous; pappus in flowering heads \pm 8 mm. long. Fruit in Java never developing. Leafy stem short, rather densely hairy; leaves rather crowded, in outline oblong or obovate; base gradually narrowed into the petiole; apex rounded, obtuse, or rather acute; leaves coarsely and regularly lyrate-pinnatifid; incisions not reaching the midrib; segments on either side 2—6, patent or obliquely erect, obtuse or acute, shallowly to coarsely dentate, increasing in size toward the apex of the leaf; leaves on both sides thinly clothed with shortish to rather long thick hairs, or subglabrous, 6—20 cm. long, 2—9 cm. wide. Perennial; erect; roots much swollen. 0.40—0.75; I—XII; believed to be a Chinese plant; in the neighbourhood of Batavia and Tandjong Priok (W.) cultivated on a small scale in the gardens of native and Chinese habitations.

Gynura lyrata Sch. Bip. was based on Z.M. 442, which was a mixture of *G. lyrata* and *G. procumbens*. The original diagnosis runs as follows: "Folia lyrata; corollae flavae". *G. pseudochina* being the only yellow-flowered Javan species with lyrate leaves, I have tentatively reduced *G. lyrata* to it. I have not seen the authentic specimen, however, and am not at all sure that the identification is correct. *G. aurantiaca* DC. also frequently has lyrate leaves but its flowers are orange-yellow turning later on dark purple. Nevertheless this species might be meant. The question is quite unimportant; the names *pseudochina* and *aurantiaca* both having right of priority over *lyrata*.

Crassocephalum M o e n c h.

Heads medium-sized, corymbose at the ends of stems and branches; flowers all tubular, regular, ♂ or a few of the ray-flowers with rudimentary anthers. Inner involucre bracts 1- to 2-seriate, conniving or cohering into a cylindrical tube, free, or at least easily separating, finally spreading or reflexed, narrow, of equal length, herbaceous, with overlapping thin translucent margins; outer bracts ∞ , much shorter than the inner ones, unequal, free. Receptacle flat, epaleaceous, alveolate; alveoles cup-shaped, with membranous dentate-lobed margins; each containing one flower. Corolla-tube long, very narrow, in the Javan species not or but slightly widened at the base; limb narrow-

ly obconical, very gradually passing into the tube, and much shorter than the latter, 5-fid; segments oblong, on the back of the tips rather coarsely papillose, otherwise glabrous. Stamens (in ♀) synantherous; anther-bases entire or nearly so; tip of connective produced into a narrow scale. Style-arms long; their truncate, \pm penicillate tips bearing a clearly defined, subulate, shortly papillose tail. Achenes narrowly linear or linear-fusiform, at the base with a pale ring, at the apex slightly dilated, with 10 close-set, finely tuberculate, longitudinal ribs, between the ribs with numerous, obliquely erect or appressed, thick hairs; pappus-hairs numerous, long, thin, finely denticulate, white, caducous. — Leaves alternate, sometimes irregularly pinnatisect, coarsely and sharply dentate. Erect herbs.

Differs from *Gynura* by the quite different tips of the style-arms, further by the corolla-tube being not or but slightly widened at the base, and by the limb of the corolla passing very gradually into the tube.

6. **Crassocephalum crepidioides** (Bth.) S. Moore in Journal of Botany L, 211 (1912), — *Gynura crepidioides* Bth. in Hooker, Niger Flora (1849), 438, — Van Steenis in De Tropische Natuur XXII (1933), 112, 113.

Corymbs not large, rather dense, densely pubescent; heads not very numerous, before and during anthesis nodding, afterwards erect. Peduncles of heads $\frac{1}{2}$ —10 cm., densely pubescent. Inner involucre bracts 18—21, linear or towards the top very gradually tapering, rather rigid, green, but with dark brown tips, pubescent on the back, 8—12 mm. long, $\frac{3}{4}$ —2 mm. wide; outer bracts rather numerous, 1—4 mm. long. Corolla $9\frac{1}{2}$ —11 mm. long, yellow with a reddish-brown top; extreme tips of segments yellowish. Anthers violet; style-arms (tail inclusive) $1\frac{1}{2}$ —2 mm. long, violet. Achenes 2— $2\frac{1}{2}$ mm. long, dark brown; pappus 10—12 mm. Stem shallowly furrowed, green, often with brown markings, in the upper part rather densely clothed with short thick hairs, glabrescent. Petioles of lower leaves $\frac{1}{2}$ —4 cm., not auriculate at the base; leaves elliptic, elliptic-oblong or \pm obovate, tapering into the petiole, and often decurrent along it, acute, sometimes irregularly pinnatisect, coarsely and sharply serrate-dentate, at first pubescent, glabrescent, 8—20 cm. long, 3—6 cm. wide; highest leaves smaller, often sessile. Annual, erect, smelling like the common garden-geranium (*Pelargonium*). 0.50—1.00 m.; fl. I—XII; plant of tropical Africa, introduced into other tropical countries (Ceylon, Sumatra); about 1926 found for the first time in the Dutch Indies in the neighbourhood of Medan (Sumatra); from there purposely introduced in Java, where it has run wild in several localities, and is likely to become a common weed; 250—1550 m. alt.; fields, tea- and Cinchona-plantations, river- and roadsides.

INDEX TO LATIN NAMES.

Cacalia aurantiaca Bl. = <i>Gynura aurantiaca</i> DC.	451
procumbens Lour. = <i>Gynura procumbens</i> Merr.	456
sarmentosa Bl. = <i>Gynura procumbens</i> Merr.	456
Conyza pubigera L. See sub <i>Gynura procumbens</i> Merr.	455
Crassocephalum Moench	457
aurantiacum O.K. = <i>Gynura aurantiaca</i> DC.	452
crepidioides S. Moore	458
densifolium O.K. var. atropurpureum O.K. = <i>Gynura aurantiaca</i> DC.	452
pseudochina O.K. = <i>Gynura pseudochina</i> DC.	457
pubigerum O.K. = <i>Gynura procumbens</i> Merr.	456
Teysmannianum O.K. = <i>Gynura aurantiaca</i> DC.	452
Gynura Cass.	450
ajakensis Hochr. = <i>Gynura densiflora</i> Miq.	454
aurantiaca DC.	451
aurantiaca Hallier non DC. = <i>Gynura densiflora</i> Miq.	454
aurantiaca Kds. non DC. = <i>Gynura densiflora</i> Miq.	454
carnosula Z.M.	453
carnulosa Z.M. = <i>Gynura carnosula</i> Z.M.	453
crepidioides Bth. = <i>Crassocephalum crepidioides</i> S. Moore	458
densiflora Miq.	454
densifolia Miq. = <i>Gynura carnosula</i> Z.M.	453
var. atropurpurea (O.K.) Kds. = <i>Gynura aurantiaca</i> DC.	452
dichotoma Turcz. = <i>Gynura aurantiaca</i> DC.	452
Lobbiana Turcz. = <i>Gynura ?procumbens</i> Merr.	456
lyrata Sch. Bip. = <i>Gynura ?pseudochina</i> DC.	457
mollis Sch. Bip. = <i>Gynura ?densiflora</i> Miq.	454
procumbens Merr.	455
pseudochina DC.	457
pubigera Bold. = <i>Gynura procumbens</i> Merr.	456
sarmentosa DC. = <i>Gynura procumbens</i> Merr.	455
Senecio pseudochina L. = <i>Gynura pseudochina</i> DC.	457

Heemstede, March 25th 1939.